



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/973,873

10/10/2001

Michael J. LaGasse

PHOL-112

7055

7590

03/19/2004

Elizabeth E. Kim
McDermott Will & Emery
28 State Street
Boston, MA 02109

EXAMINER

MOONEY, MICHAEL P

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

14

Office Action Summary

Application No.

09/973,873

Applicant(s)

LAGASSE ET AL.

Examiner

Michael P. Mooney

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17,18,25 and 26 is/are allowed.
- 6) ☒ Claim(s) 1-7,14-16 and 19 is/are rejected.
- 7) ☒ Claim(s) 8-13 and 20-24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/25/02</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 14-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Cisternino et al. (6204956).

Cisternino et al. teaches an optical pulse generation system, including: A. a first optical interferometric modulator including: i. an optical input for receiving an input optical signal, ii. at least one modulation input for receiving a first modulation drive signal centered about a first normalized bias voltage V1, the first modulation drive signal modulating the input optical signal about the first normalized bias voltage with a first normalized amplitude A1; and iii. an optical output for providing a first modulated optical signal; and B. a second optical interferometric modulator including: i. an optical input for receiving the first modulated optical signal; ii. at least one modulation input for receiving a second modulation drive signal centered about a second normalized bias voltage V2, the second modulation drive signal modulating the first modulated optical signal about the second normalized bias voltage with a second normalized amplitude A2; and iii. an optical output for providing a second modulated optical signal comprising output optical

Art Unit: 2877

pulses; wherein said first modulation drive signal and said second modulation drive signal are periodic functions of time; and wherein at least one of said first modulation drive signal and said second modulation drive signal comprises a superposition of a plurality of waveforms having different frequencies. (fig. 1; Abstract; col. 2 lines 28-38; col. 5 lines 34-64).

Thus claim 1 is met.

Cisternino et al. teaches wherein said superposition of waveforms includes: i) a base waveform characterized by a base frequency ω_0 , and ii) one or more odd harmonics of said base waveform, said odd harmonics being characterized by frequencies ω_n related to said base frequency ω_0 according to the formula: $\omega_n = (2n+1) \cdot \omega_0$ where n is a nonzero integer. (fig. 1; Abstract; col. 2 lines 28-38; col. 5 lines 34-64).

Thus claim 2 is met.

Cisternino et al. teaches wherein said first optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V_{\pi 1}$ that represents the voltage required to change the output power from the first modulator from a minimum value to a maximum value; wherein said second optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V_{\pi 2}$ that represents the voltage required to change the output power from the second modulator from a minimum value to a maximum value; wherein said first normalized bias voltage V_I and said first normalized amplitude A_1 are normalized relative to $V_{\pi 1}$; and wherein said

Art Unit: 2877

second normalized bias voltage V1 and said second normalized amplitude A2 are normalized relative to V_{pi}.sub.2. (fig. 1; Abstract; col. 2 lines 28-38; col. 5 lines 34-64).

Thus claim 4 is met.

The reasons and references above show that Cisternino et al. teaches each and every element of claims 14-16. Thus claims 14-16 are met.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102b as being anticipated by Nazarathy et al. (5278923).

Nazarathy et al. teaches a method of generating optical pulses, the method including: A. generating a first modulated optical signal comprising optical pulses by applying a first modulation drive signal to a modulation input of a first optical interferometric modulator so as to modulate an input optical signal that has been received into an optical input of said first interferometric modulator, said first modulation drive signal being characterized by a first normalized bias voltage and a first normalized amplitude; B. generating a second modulated optical signal comprising optical pulses by applying a second modulation drive signal to a modulation input of a second optical

Art Unit: 2877

interferometric modulator so as to modulate the first modulated optical signal with a second modulation drive signal characterized by a second normalized bias voltage and a second normalized amplitude; wherein the first modulation drive signal and the second modulation drive signal are periodic functions of time, and wherein at least one of the first modulation drive signal and the second modulation drive signal comprises a superposition of a plurality of waveforms having different frequencies. (Abstract; col. 15 lines 15-50; col. 20 lines 5-13).

Thus claim 19 is met.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3, 5, 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisternino et al. (6204956).

Cisternino et al. teaches an optical pulse generation system, including: A. a first optical interferometric modulator including: i. an optical input for receiving an input optical signal, ii. at least one modulation input for receiving a first modulation drive signal centered about a first normalized bias voltage V_1 , the first modulation drive signal modulating the input optical signal about the first normalized bias voltage with a first normalized amplitude A_1 ; and iii. an optical output for providing a first modulated optical signal; and B. a second optical interferometric modulator including: i. an optical input for receiving the first modulated optical signal; ii. at least one modulation input for receiving a second modulation drive signal centered about a second normalized bias voltage V_2 , the second modulation drive signal modulating the first modulated optical signal about the second normalized bias voltage with a second normalized amplitude A_2 ; and iii. an optical output for providing a second modulated optical signal comprising output optical pulses; wherein said first modulation drive signal and said second modulation drive signal are periodic functions of time; and wherein at least one of said first modulation drive signal and said second modulation drive signal comprises a superposition of a plurality of waveforms having different frequencies. (fig. 1; Abstract; col. 2 lines 28-38; col. 5 lines 34-64).

Cisternino et al. teaches a base frequency of 10 GHz. (col. 4 lines 26-47). It would have been prima facie obvious to one of ordinary skill in the art to state base frequency ω_0 is from about 5 GHz to about 10 GHz as done in claim 3. The MPEP addresses this as follows:

2144.05 Obviousness of Ranges

I. OVERLAP OF RANGES

In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In *re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of “50 to 100 Angstroms” considered prima facie obvious in view of prior art reference teaching that “for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms].” The court stated that “by stating that suitable protection is provided if the protective layer is about 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within applicant’s claimed range.”). Similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of “having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium” as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.).

Thus, claim 3 is rejected.

Although *Cisternino et al.* does not explicitly teach “wherein the relative amplitudes of said plurality of waveforms are selected so that the optical pulses in the second modulated signal have at least one of a predetermined extinction ratio and a predetermined pulse width” it would have been obvious to do so because (a) it is notoriously well known (NWK) for modulators such as those used in *Cisternino et al.* to have a predetermined extinction ratio; and (b) *Cisternino* teaches a predetermined pulse width at col. 1 lines 50-55.

Thus claim 5 is rejected.

Reason “(a)” in the rejection of claim 5 above in addition to the above reasons and references is sufficient to show that *Cisternino et al.* renders each and every

Art Unit: 2877

element of claim 6 as obvious to one of ordinary skill in the art at the time the invention was made. Thus claim 6 is rejected.

Reason "(b)" in the rejection of claim 5 above in addition to the above reasons and references is sufficient to show that Cisternino et al. renders each and every element of claim 7 as obvious to one of ordinary skill in the art at the time the invention was made. Thus claim 7 is rejected.

Allowable Subject Matter

Claims 17-18, 25-26 are allowed.

Claims 8-13, 20-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2877

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-

1562.



Michael P. Mooney
Examiner
Art Unit 2877



Frank G. Font
Supervisory Patent Examiner
Art Unit 2877

FGF/mpm
3/5/04